

## **BAB V**

### **KESIMPULAN DAN SARAN**

#### **5.1. Kesimpulan**

1. Proporsi kombinasi bubuk bayam dan tapioka dengan isolat protein kedelai berpengaruh nyata terhadap sifat fisikokimia *snack* bayam, yaitu kadar air dan tekstur (daya patah dan kerenyahan), sedangkan aktivitas antioksidan tidak berpengaruh nyata.
2. Peningkatan proporsi isolat protein kedelai pada *snack* bayam meningkatkan kadar air, daya patah, kerenyahan, dan warna (*lightness* dan *°hue*), sedangkan kadar Fe dan aktivitas antioksidan menurun.
3. Proporsi kombinasi bubuk bayam dan tapioka dengan isolat protein kedelai berpengaruh nyata terhadap sifat organoleptik *snack* bayam, yaitu warna, daya patah, kerenyahan, dan rasa.
4. Peningkatan proporsi isolat protein kedelai pada *snack* bayam meningkatkan tingkat kesukaan konsumen terhadap warna, daya patah, dan kerenyahan, sedangkan tingkat kesukaan konsumen terhadap rasa menurun.
5. Perlakuan *snack* bayam terbaik yaitu perlakuan proporsi kombinasi bubuk bayam dan tapioka dengan isolat protein kedelai 84%:16% dengan nilai tingkat kesukaan rasa 2,8625 (agak tidak suka), daya patah 5,5875 (suka), kerenyahan 5,8750 (suka), dan warna 5,7625 (suka).

#### **5.2. Saran**

Perlu dilakukan pengujian untuk mengetahui umur simpan *snack* bayam dan pengembangan formulasi untuk meningkatkan sifat organoleptik.

## DAFTAR PUSTAKA

- Akubor, P. I. 2003. Functional properties and performance of cowpea/plantain/wheat flour blends in biscuits. *Plant Foods for Human Nutrition*, 58(3): 1—8.
- Ambrose, D. C. P., Manickavasagan, A. and Naik, R. 2016. *Leafy Medicinal Herbs: Botany, Chemistry, Postharvest Technology and Uses*. India: CABI.
- Angier, B. 2008. *Field Guide to Medicinal Wild Plants*. USA: Satckpole Books.
- Ankita, K. P. 2013. Studies on spinach powder as affected by dehydration temperature and process of blanching. *International Journal of Agriculture and Food Science Technology*, 4(4): 309-316.
- Ankita, K. P. 2015. Characterization of dehydrated functional fractional spinach powder. *Biotechnology An Indian Journal*, 11(11): 426-435.
- Apriyantono, A., Fardiaz, D., Puspitasari, N. L., Sedarwati and Budiyanto, S.1989. *Analisis Pangan*. Bogor: Institut Teknologi Bogor.
- Arrohmah. 2007. *Studi Karakteristik Klorofil Daun Sebagai Material Photodetector Organik*. Skripsi Fisika MIPA Surakarta: UNS.
- Badan Pusat Statistik. 2017. *Konsumsi Buah dan Sayur Susenas Maret 2016*. Jakarta: Badan Pusat Statistik.
- Badan Standardisasi Nasional (BSN). 1996. SNI 01-4305-1996. *Keripik Singkong*. Jakarta: Badan Standardisasi Nasional.
- Badan Standardisasi Nasional (BSN). 2009. SNI-3751-2009. *Tepung Terigu sebagai Bahan Makanan*. Jakarta: Badan Standardisasi Nasional.
- Blackley, D. C. 2012. *Polymer Latices: Science and Technology*. London: Springer Science and Business Media.
- Campbel, M. and Farrel, S. 2007. *Biochemistry*. Australia: Cengage Learning.

- Chen, S. D., Chen, H. H., Chao, Y. C. and Lin, R. S. 2009. Effect of batter formula on qualities of deep-fat and microwave fried fish nuggets. *Journal of Food Engineering*, 95(2): 359—364.
- Chiras, D. D. 2005. *Human Biology*. USA: Jones and Bartlett Learning.
- Dehpour, A. A., Ebrahimzadeh, M. A., Fazel, N. S. and Mohammad, N. S. 2009. Antioxidant activity of methanol extract of *Ferula assafoetida* and its essential oil composition. *Grasas Aceites*, 60(4): 405-412.
- Devadason, I. P., Anjaneyulu, A. S. R. and Babji, Y. 2010. Effect of different binders on the physico-chemical, textural, histological, and sensory qualities of retort pouched buffalo meat nuggets. *Journal of Food Science*, 75(1): 31-35.
- Deveci, M. 2011. Determination of phenolic compounds and chlorophyll content of spinach (*Spinacia oleracea* L.) at different growth stages. *Asian Journal of Chemistry*, 23(8): 3739—3743.
- Direktorat Gizi Depkes RI. 1981. *Daftar Komposisi Bahan Makanan*. Jakarta: Bhratara Karya Aksara.
- Direktorat Standardisasi Produk Pangan. 2007. *Acuan Label Gizi Produk Pangan*. Jakarta: Badan POM RI.
- Dogan, S. F., Sahin, S. and Sumnu, G. 2005. Effects of soy and rice flour addition on batter rheology and quality of deep-fat fried chicken nuggets. *Journal of Food Engineering*, 71: 127–132.
- Drews, H. J. 1996. Analysis of free sugars and chlorophyll in spinach from a local retail market. *Masters Thesis*. University of Tennessee.
- Gomez, P. L., Loreda, A. G., Salvatori, D. M., Guerrero, S. dan Alzamora, S. M. 2011. Viscoelasticity, texture and ultrastructure of cut apple as affected by sequential anti-browning and ultraviolet-C light treatments. *Journal of Food Engineering*, 107: 214—225.
- Grubben, G. J. H. 2004. *Plant Resources of Tropical Africa 2: Vegetables*. Netherlands: Backhuys Publishers.
- Harper, J. M. 1981. *Extrusion of Foods*. Boca Raton: CRC Press, Inc.

- Hess, J. M., Jonnalagadda, S. S. and Slavin, J. L. 2016. What is a snack, why do we snack, and how can we choose better snacks? A review of the definition of snacking, motivations to snack, contributions to dietary intake, and recommendations for improvement. *Advances in Nutrition*, 7(3): 466—475.
- Hong-Wu, J., Guang-Kun, P., Shu-Cheng, L., Wei-Ming, S., Hong-Yu, L. and Chuang, P. 2014. Effect of soy protein isolate on quality of fried breaded shrimp. *Modern Food Science and Technology*, 30(4): 104-111.
- Howard, L. R., Pandjaitan, N., Morelock, T. and Gil, M. I. 2002. Antioxidant capacity and phenolic content of spinach as affected by genetics and growing season. *Journal of Agriculture and Food Chemistry*, 50: 5891—5896.
- Hui, Y. H., Ghazala, S., Graham, D. M., Murrell, K. D. and Nip, W. K. 2003. *Handbook of Vegetable Preservation and Processing*. New York: CRC Press.
- Hui, Y. H. 2006. *Handbook of Food Science, Technology, and Engineering*. Boca Raton: CRC Press.
- Hutchings, J. B. 1999. *Food Colour and Appearance*. Maryland: Aspen Pub.
- Hutchings, J. B. 2002. *The Perception and Sensory Assessment of Colour*. Cambridge: Woodhead Publishing Limited.
- Jati, I. R. A. P., Nohr, D. and Biesalski, H. K. 2009. Micronutrient, Bioactive Compound, and Antioxidant Activity of Indonesian Purple and Orange-Fleshed Sweet Potato. *Nutrition and Food Science*.
- Jha, S. N. 2010. *Color Measurement and Modelling*. India: Springer-Verlag Berlin Heidelberg.
- Joachim, D. and Schloss, A. 2014. *Fine Cooking*. Canada: Taunton Press.
- Kaplan, D. 1998. *Biopolymers from Renewable Resources*. USA: Springer Science and Business Media.
- Kartasmita, R. E., Tuslinah, L. and Fawaz, M. 2008. Penentuan kadar Besi (II) dalam sediaan tablet Besi (II) Sulfat menggunakan metode Orto Fenantrolin. *Jurnal Kesehatan Bakti Tunas Husada*, 1(1).

- Katz, E. E. and Labuza, T. P. 1981. Effect of water activity on the sensory crispness and mechanical deformation of snack food products. *Journal of Food Science*, 46(2): 403–409.
- Kementrian Pertanian Direktorat Jenderal Hortikultura. 2015. *Statistik Produksi Hortikultura Tahun 2014*. Jakarta: Direktorat Jenderal Hortikultura, Kementrian Pertanian.
- Khoo, H. E., Prasad, K. N., Kong, K. W., Jiang, W. and Ismail, A. 2011. Carotenoids and their isomers: Color Pigments in Fruits and Vegetables. *Molecules*, 16: 1710—1738.
- Kilcast, D. 2004. *Texture in Food: Solid Foods*. England: Woodhead Publishing Limited.
- Kusumastuti, K. and Ayustaningwarno, F. 2013. Pengaruh penambahan bekatul beras merah terhadap kandungan gizi, aktivitas antioksidan dan kesukaan sosis tempe. *Journal of Nutrition College*, 2(1): 27-34.
- Lee, J., Lee, S., Lee, H., Park, K. and Choe, E. 2002. Spinach (*Spinacia oleracea*) powder as a natural food-grade antioxidant in deep-fat-fried products. *Journal of Agricultural and Food Chemistry*, 50: 5664-5669.
- Lestari, F. 2007. *Bahaya Kimia: Sampling dan Pengukuran Kontaminan Kimia di Udara*. Jakarta: Penerbit Buku Kedokteran EGC.
- Lestari, A. L., Lestari, P. M. and Utami, F. A. 2018. *Kandungan Zat Gizi Makanan Khas Yogyakarta*. Yogyakarta: UGM Press.
- Mah, E. and Brannan, R. G. 2009. Reduction of oil absorption in deep-fried, battered, and breaded chicken patties using whey protein isolate as a postbreeding dip: Effect on flavor, color, and texture. *Journal of Food Science*, 74(1): 9—16.
- Miller, D. 1996. *Food Chemistry*. New York: Marcel Dekker.
- Molenda, M., Stasiak, M., Horabik, J., Fornal, J., Blaszcak, W. and Ornowski, A. 2006. Microstructure and mechanical parameters of five types of starch. *Polish Journal of Food and Nutrition Sciences*, 15(2): 161-168.

- Namiki, M., Yabuta, G., Koizumi, Y. and Yano, M. 2001. Development of free radical products during the greening reaction of caffeic acid esters (or chlorogenic acid) and a primary amino compound. *Biosci Biotech Biochem*, 65(10): 2131–2136.
- Nasiri, F. D., Mohebbi, M., Yazdi, F. T. and Khodaparast, M. H. H. 2012. Effects of soy and corn flour addition on batter rheology and quality of deep fat-fried shrimp nuggets. *Food and Bioprocess Technology*, 5(4): 1238—1245.
- Page, L. R. 1998. *Healthy Healing: A Guide to Self-healing for Everyone*. USA: Healthy Healing, Inc.
- Prakash, A., Rigelhof, F. and Miller, E. 2001. Antioxidant activity: Medallion laboratories. *Analytical Progress*, 19(2): 1-4.
- Rahayu, W. P. 1998. *Diktat Penuntun Praktikum Penilaian Organoleptik*. Bogor: Fakultas Teknologi Pertanian, IPB.
- Rahimi, J. 2014. *Microstructure and Surface Characterization of Fried Batter Coatings*. Canada: McGill University.
- Rahman, A. 2000. *Bioactive Natural Products*. Pakistan: Elsevier.
- Rajendran, S., Indurani, C., and Arumuganathan, T. 2016. Utilization of deseeded moringa pods in food fortification and value addition. *Advances in Life Sciences*, 5(21): 9785--9789.
- Ridwansyah, Nasution, M. Z., Sunarti, T. C. and Fauzi, A. M. 2007. Karakteristik sifat fisiko-kimia pati kelapa sawit. *Jurnal Teknologi Industri Pertanian*, 17(1): 1-6.
- Rossell, J. B. 2001. *Frying: Improving Quality*. USA: Woodhead Publishing.
- Rukmana, H. R. 2005. *Bertanam Sayuran di Pekarangan*. Yogyakarta: Kanisius.
- Saefudin, Marusin, S. and Chairul. 2013. Aktivitas antioksidan pada enam jenis tumbuhan *Sterculiaceae*. *Jurnal Penelitian Hasil Hutan*, 31(2): 103—109.
- Sharma, M. 2011. *Therapeutic Pediatric Nutrition*. India: JP Medical Ltd.

- Shucheng, L. 2014. Effect of soy protein isolate on quality of fried breaded shrimp. *Modern Food Science and Technology*, 30(4): 104-111.
- Sutrisno, A. 2017. *Teknologi Enzim*. Malang: Universitas Brawijaya Press.
- Syarif, R. and Halid, H. 1993. *Teknologi Penyimpanan Pangan*. Jakarta: Arcan.
- Tan, C. T. and Francis, F. J. 1962. Effect of Processing Temperature on Pigmen and Color of Spinach. *Journal of Food Science*, 27: 232-241.
- Vaclavik, V. A. and Christian, E. W. 2008. *Essentials of Food Science*. USA: Springer Science and Business Media.
- Varelis, P., Melton, L. and Shahidi, F. 2018. *Encyclopedia of Food Chemistry*. New York: Elsevier Inc.
- Wildermuth, S. R., Young, E. E. and Were, L. M. 2016. Chlorogenic acid oxidation and its reaction with sunflower proteins to form green-colored complexes. *Comprehensive Reviews in Food Science and Food Safety*, 15(5).
- World Health Organization. 2013. *WHO Issues New Guidance on Dietary Salt and Potassium*. Switzerland: WHO.
- Zhang, L., Yang, M., Ji, H. and Ma, H. 2014. Some physicochemical properties of starches and their influence on color, texture, and oil content in crusts using a deep-fat-fried model. *CyTA-Journal of Food*, 12(4): 347-354.